

WHAT IS CLAIMED IS:

- 5 1. A recipient mouse comprising:  
a disruption in both alleles of a gene such that lymphocyte maturation does  
not occur; and  
exogenous transgenes that encode cytokines comprising IL-7, SCF and LIF.
- 10 2. A recipient mouse comprising:  
a disruption in both alleles of a gene such that lymphocyte maturation does  
not occur; and  
exogenous transgenes that encode cytokines comprising GM-CSF, M-CSF  
and IL-6.
- 15 3. A recipient mouse comprising:  
a disruption in both alleles of a gene such that lymphocyte maturation does  
not occur; and  
exogenous transgenes that encode cytokines comprising IL-7, SCF, LIF,  
GM-CSF, M-CSF and IL-6.
- 20 4. The mouse of claims 1-3, wherein the disruption is in a gene that  
modulates VDJ recombination. (B)
- 25 5. The mouse of claim 4, wherein said gene is a RAG gene.
6. The mouse of claims 1-3, wherein the cytokines are human cytokines.
- 30 7. A method of making a mouse lacking in mature T and B cells and  
comprising exogenous cytokines comprising the steps of:  
inactivating VDJ recombination; and  
introducing transgenes, wherein said transgenes encode human cytokines  
necessary for support of human cells in the mouse.
- 35 8. The method of claim 7, wherein the step of introducing the transgenes is  
through pronuclear transfer.
9. The method of claim 7, wherein the transgenes are in an embryonic stem  
cell.

10. The method of claim 7, wherein the step of introducing the transgenes is through breeding said mouse with a mouse that comprises the transgenes.

5 mouse. 11. The method of claim 7, wherein the mouse is a RAG-1<sup>-</sup> or a RAG-2<sup>-</sup>

12. The method of claim 7 wherein said cytokines comprise IL-7, SCF and LIF.

10 and M-CSF. 13. The method of claim 7 wherein said cytokines comprise IL-6, GM-CSF

14. The method of claim 7 wherein said cytokines comprise IL-7, SCF, LIF, IL-6, GM-CSF and M-CSF.

15 transgene. 15. The mouse of claim 1, wherein said mouse further comprises a MHC

20 transgene. 16. The mouse of claim 15, wherein said MHC transgene is a human HLA

25 17. A recipient mouse comprising:  
a disruption in both alleles of a gene such that lymphocyte maturation does not occur; and  
a human transgene comprising a nucleic acid sequence that encodes a MHC Class II DR3 molecule, wherein the transgene comprises naturally linked DRab and DQab alleles.

30 18. The mouse of claim 17 wherein the disruption is in a gene that modulates VDJ recombination.

19. The mouse of claim 18, wherein the gene is a RAG gene.

20. The mouse of claim 19, wherein said mouse is deficient for murine I-E $\alpha$ .

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21. The mouse of claim 17, wherein the transgene further comprises a human HLA DQ2 gene.

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22. A method of making a recipient mouse, said method comprising:  
disrupting both alleles of a gene so that lymphocyte maturation does not occur;  
inserting a transgene comprising nucleic acid that encodes MHC Class II DR3 and DQ2 molecules, wherein the DRab and DQab alleles are naturally linked; and  
inactivating murine I-E $\alpha$ .

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23. The method of claim 22, wherein said disruption is in a gene that modulates VDJ recombination.

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24. The method of claim 23, wherein said gene is RAG-2.

25. The method of claim 24, wherein said transgene is in an artificial yeast chromosome.

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length.

26. The method of claim 25, wherein the transgene is about 550 kb in

27. The method of claim 26, wherein the artificial yeast chromosome is

4D1.

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28. A method of making a recipient mouse, said method comprising:  
preventing VDJ recombination by mutating both alleles of the RAG-2 gene;  
inserting a transgene comprising the Drab and DQab alleles of the MHC Class II DR3 haplotype; and  
inactivating murine I-E $\alpha$ .

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